rations and extensions of many private mansions. Among his works, the single-arched iron bridge over the River Cam, at St. John's College, Cambridge, has been much admired; and the church of St. Mark's, Clerkenwell, met with considerable approval at the period of its erection, forty years since.

Mr. Mylne in later years was much occupied in Government references, and acted as surveyor for fifty years to the Stationers' Company, having succeeded his father in that office. He was also extensively engaged before Parliamentary Committees on Water, Dock, and Drainage Works, and was consulted in continental works of similar character.

From the date of his entering on the direction of the New River Works to his retirement, two years before his death—a period of fifty years—he had the satisfaction to witness a very great advance in the income of the Company, and a great extension of their works, consequent on the increased demand caused by the further growth of the metropolis and awakened attention to its salubrity. In 1852 new works were undertaken to the extent of three quarters of a million sterling, and executed by him, with the assistance of his son, R. W. Mylne, F.R.S.

Mr. Mylne was a man of a peculiarly kind and conciliatory disposition, a peace-maker in all professional strife, of strict integrity and high honourable feeling. He was for many years the guiding hand, as Treasurer, to the Society of Engineers styled "Smeatonians," in which, as in all other Associations, he won the respect, esteem, and almost affection of those with whom he was connected. His retiring disposition caused him seldom to take part in scientific discussions; but he took a keen interest in all questions of progress, and during his long career judiciously availed himself of the opportunities offered him of adopting the new inventions of the age.

Mr. Mylne was elected a Fellow of the Royal Society on the 16th of March, 1826.

Major-General **Joseph Ellison Portlock**, son of Captain Nathaniel Portlock, a distinguished officer of the Royal Navy, was born at Gosport in September 1794. He received his early education at a school in his native town and at Tiverton, from which he went to the Royal Military Academy at Woolwich. In 1813 he took his first commission in the Royal Engineers, and was sent in the following year to Canada, where he remained actively employed in military service or exploring expeditions until 1822. He was present at the siege of Fort Erie; and, on the retirement of the troops, he constructed the lines and bridge-head at Chippewa, at which Sir Gordon Drummond made his successful stand, and saved Upper Canada.

In 1824, on the extension of the Ordnance Survey to Ireland, Lieut. Portlock was one of the officers first selected by Colonel Colby to take part in the work; and his earliest duty in connexion therewith, conjointly with Lieuts. Drummond and Larcom, lay in working out the preliminaries of what has since grown into first-rate importance as the Topographical Department. The task at that time was beset by difficulties, which the progress of physical and mechanical science has since removed: the preparation of the base-apparatus, the construction of astronomical and other surveying-instruments, the contriving of signals by lamp and heliostat, and the training of sappers for their special duties had to be undertaken under the disadvantage of newness. But at that time the Duke of Wellington was Master-General of the Ordnance; and supported by him, Colonel Colby carried out his plans in full efficiency.

In 1825 the first detachments were removed to Ireland, and the first trigonometrical station was taken up on Divis Mountain, near Belfast. There the first signals and observations with lamp and heliostat were attempted, and, to the satisfaction of the originators, proved completely successful. This was Lieut. Portlock's start on the trigonometrical branch of the survey, of which he shortly became the senior, and eventually sole officer.

In addition to scientific skill and accuracy, great personal endurance was required in carrying on the observations. In 1826 the camp on Slieve Donard, 2800 feet above the sea, was more than once blown down by the violence of the wind. Colonel Colby was seriously injured by a fall while climbing from the observatory to his tent; and communication with the country below involved both difficulty and danger. Yet "Portlock," we are told, "held out to the last. For some weeks he was the only officer remaining; but he struggled on, and brought the operations to a successful close."

In the following year, while Colonel Colby was measuring the base on the shore of Lough Foyle, Lieut. Portlock, with Lieut. Larcom, carried out the observations at seven hill-stations, regardless of season and weather. In 1828, and for some years afterwards, he performed the work single-handed, observing with the great theodolite from mountain after mountain till the principal network of triangulation was complete, and the Irish system was, by means of the lamp and heliostat signals, united to that of Britain. In addition, care had to be taken for the direction of the secondary triangulation for the details of the survey, and for the rectification of errors and the discrepancies that were sure to occur at the junction of the separate districts. For this the whole had to be combined under one general system; and this additional labour Lieut. Portlock undertook while still on the mountains. He carried it on afterwards at his office in Dublin; and so well did he direct these secondary operations, that, after the parties became used to the work, the surveying went on at the rate of three million acres a year.

The horizontal survey involved the necessity of an elaborate vertical survey and calculations for altitude. The altitudes were deduced at first from the sea, by actual levelling from it to bases of altitude, and from them transferred, by angles of elevation and depression, to the summit of every hill and station, at distances averaging a mile asunder; and on this the minor levelling of the detail survey depended. This also was ultimately generalized into a system by Lieut. Portlock, and by him furnished regularly and rapidly. In fulfilling this purpose, he personally carried a line of levelling across the island from the coast of Down to the coast of Donegal, and caused several lines to be observed in other places. In this way a more general and homogeneous system of altitudes was obtained than had ever before been attempted. It supplied the data for the paper on Tides by the Astronomer Royal, published in the 'Philosophical Transactions.'

In all this we see a character conspicuous alike for ability and energetic perseverance; but among its other elements, there was one which may be properly noticed here—the praiseworthy example he set to the men under his command. They felt that with him they were in the hands of something superior to themselves in intellect and acquirements, and they improved in a marked degree in the duties of the survey, in intelligence, and the habit of obedience. "They needed only encouragement, no coercion, and they rapidly acquired knowledge; to all of which I can testify," writes one of Portlock's brother officers; "and I am sure it is the experience of the whole corps, more perhaps than any other in the army, that when officers study the characters of their men, and use in governing them the knowledge so acquired, they are amply rewarded by the result, and need no coarser discipline." Sergeant Manning, who worked under Lieut. Portlock through the whole period of his service on the Irish survey, was chosen as the non-commissioned officer best fitted to take charge of a party sent in 1848 to the Cape of Good Hope, to verify, under direction of Mr. (now Sir Thomas) Maclear, the base measured by Lacaille nearly a century before.

Of the great value of the Irish survey in connexion with the geology, archæology, statistics, and industrial resources of Ireland, this is not the place to speak. Suffice it to say that when the time came for drawing up a Report on the subject, Lieut. Portlock proved himself not less able as a geological than as a geodetical observer. His separate Report on the Geology of Londonderry has been pronounced by high authority to be "a perfect model for fidelity of observation and minute attention to phenomena." It is safe to affirm that the name of Portlock will ever be most honourably associated with the history of the Ordnance Survey of Ireland.

In 1843 Captain Portlock was ordered to Corfu on the ordinary duties of his corps. In the comparative leisure which he then enjoyed he wrote papers on the geology and natural history of the island, and on professional subjects. Some of these were published in the Reports of the British Association, the Annals of Natural History, and Journal of the Geological Society. The Association voted him a grant "for the Exploration of the Marine Zoology of Corfu," the results of which he embodied in two papers subsequently published. In these again we have evidence of his activity of mind and accuracy of observation.

Recalled to England in 1847, Major Portlock was stationed first at Portsmouth, and afterwards, as Lieut.-Colonel, at Cork. From this time the literature of his profession and scientific study engaged much of his attention. The annual volumes published by the British Association contain papers from his pen; and besides contributions to the *Professional Papers* of the corps, he wrote the articles "Geology and Geodesy," "Galvanism," "Heat," "Palæontology," and an Appendix on Gun-Cotton for the *Aide-mémoire*, and the Treatise on Geology in Weale's Rudimentary Series. Others of his papers appear in the Journal of the Geological Society of Dublin, of which Society he was four times President.

In 1851 Lieut.-Col. Portlock was appointed Inspector of Studies at the Royal Military Academy, Woolwich, in which place he helped forward measures for improving the scientific character of the system of education, and increasing its efficiency generally; and during this period he wrote the articles "Cannon," "Fort," "Gunnery," and revised the article "War" for the 8th edition of the 'Encyclopædia Britannica,' besides translating for the new series of *Professional Papers* a work on Gunpowder (from the French), and a treatise on Strategy (from the Italian). He wrote also a memoir of his former chief, Major-General Colby, a publication honourable alike to the subject and the author. To all this must be added the two Addresses delivered by him as President of the Geological Society in 1857 and 1858, which, in the words of an eminent authority, are characterized by "faithful and elaborate research."

After resigning his appointment at Woolwich, and holding the command for a few months at Dover, Major-General Portlock became in 1857 a Member of the Council of Military Education, in whose proceedings, as might have been expected, he took an active and earnest part. His sentiments with regard to the objects in view may be gathered from a memorandum drawn up by one of his colleagues, who writes, "General Portlock's opinions on the questions presented to him as a Member of the Council were in all cases those of the most forward advocates of education. He looked upon competition as the great principle upon which public appointments should be made, nor did he shrink from the inevitable social results which such a change would involve. Education, combined with good morals, he regarded as constituting a paramount claim to the rank of gentleman. He was therefore a warm advocate of the system of open competition as applied to the elections into the Royal Military Academy of Woolwich; nor did he share the apprehension, which has been very frequently expressed, of a consequent lowering of the social position of the officers of the two great scientific corps.

The weakness and infirmities of advancing years were borne by General Portlock with a spirit not less calm and patient than that which animated him through the hardships of the Ordnance Survey. He retired to Lota, a pleasant spot near Dublin, and there died on the 14th February, 1864. He was elected a Fellow of the Royal Society in June 1837, and was a member of other metropolitan and provincial Societies. The honorary degree of Doctor of Laws was conferred on him by Trinity College, Dublin, in 1857."

This brief notice of one who was for twenty-seven years an honour to the Society, may be fittingly closed with a few words of affectionate testimony by a brother officer, to whose Memoir we are indebted for much of the foregoing. "The characteristics which shone forth in Portlock during his well-spent life," writes Major-General Sir Thomas Larcom, "whether as a soldier, a geographer, or a geologist, were—undaunted courage in facing difficulties, Spartan endurance and invincible perseverance in overcoming them. Endowed, when in the zenith of his career, with a frame and nerves of iron, he exhibited such a vast power of continuous labour, that he achieved every object he had in view; while great ability, and a pure love of knowledge, were in him guided and governed by the highest sense of honour and moral rectitude."

Dr. **ARCHIBALD ROBERTSON** was born at Cockburnspath in Scotland, on the 3rd of December, 1789. He studied medicine at Edinburgh, and in 1808 entered the Naval Medical Service. After some years of active employment in Europe and America, he on the termination of the war resorted again to Edinburgh for the further prosecution of study, and took his degree of M.D. in that University in 1817. He then settled as a physician in Northampton; and although for more than a twelvemonth he did not receive the encouragement of a single fee, he held on to the position he had taken, and was soon rewarded by large and lucrative employment, his success being promoted and assured by his being in 1820 elected Physician to the Northampton Infirmary. After a long and prosperous professional career, and the acquisition of a handsome independence honourably earned, he in 1853 resolved to withdraw himself from the labour of active practice. He accordingly left Northampton, and passed the rest of his life in retirement in the west of England.

Dr. Robertson was a man of considerable literary accomplishment, and, before his time became engrossed by practice, he was in the habit of writing literary articles in some of the journals and reviews of the day. He contributed two short articles on professional subjects to Forbes's 'Cyclopædia of Medicine.' He was elected a Fellow of the Royal Society on the 11th of February, 1836.

Both as a physician and as a member of society, Dr. Robertson was highly esteemed. His death took place at Clifton, on the 19th of October, 1864.

GIOVANNI ANTONIO AMEDEO PLANA, descended from an ancient and distinguished family of Guarene in Piedmont, was born at Voghera, on the 8th of November, 1781. In 1800 he entered the Polytechnic School of Paris, where he so greatly distinguished himself that, on the 23rd of May, 1803, he was appointed Professor in the Artillery School of Alessandria.